CLAIMS:

1. A DC/DC up/down converter (30), comprising inductive energy storage means, switching means (S1, S2, S3) and control means (40), wherein said control means (40) are arranged for selectively operating said switching means (S1, S2, S3) for transferring an amount of electrical energy from said energy storage means (L) to an output of said DC/DC converter (30), characterized in that said control means (40) are configured for operatively controlling said switching means (S1, S2, S3) for transferring electrical energy to a first output (Vout1) of said DC/DC converter (30) in a down-conversion mode and for transferring electrical energy from said first output (Vout1) to a second output (Vout2) of said DC/DC converter (30) in an up-conversion mode.

2. A DC/DC up/down converter (30) according to claim 1, comprising:

- first and second input terminals (31, 32);
- first and second output terminals (33, 34);
- third and fourth output terminals (35, 36);
- a coil (L), having first and second connection ends, wherein said second connection end connects to said first output terminal (33);
- first switching means (S1) operatively connected to provide a conduction path from said first connection end of said coil (L) to said second input terminal (32);
- second switching means (S2) operatively connected to provide a conduction path from said first connection end of said coil (L) to said third output terminal (35);
- third switching means (S3) operatively connected to provide a conduction path from said first input terminal (31) to said first connection end of said coil (L);
- first diode means (D1) parallel connected to said first switching means (S1), and providing a conduction path from said fourth output terminal (36) to said first connection end of said coil (L), and

- second diode means (D2) parallel connected to said second switching means (S2), and providing a conduction path from said first connection end of said coil (L) to said second output terminal (35); and

- control means (40) arranged for operatively switching said first, second and third switching means (S1, S2, S3) into their closed or conductive state and open or non-conductive state.

3. A DC/DC up/down converter (30) according to claim 2, wherein said control means (40) are arranged for controlling said switching means (S1, S2, S3) in a conversion cycle comprising:

- a first phase (Φ0) wherein said third switching means (S3) are in a conductive state and said first and second switching means (S1, S2) are in a non-conductive state;

- a second phase (Φ1) wherein said first switching means (S1) are in a conductive state and said second and third switching means (S2, S3) are in a non-conductive state;

- a third phase (Φ2) wherein said first switching means (S1) are in a conductive state and said second and third switching means (S2, S3) are in a non-conductive state;

- a fourth phase (Φ3) wherein said second switching means (S2) are in a conductive state and said first and third switching means (S1, S3) are in a non-conductive state, and wherein current flow (I) in said coil (L) is in opposite direction compared to said second phase (Φ1);

- a fifth phase (Φ4) wherein said first, second and third switches (S1, S2, S3) are in a non-conductive state;

- a sixth phase (Φ5) wherein said first, second and third switches (S1, S2, S3) are in a non-conductive state and current
flow (I) in said coil (L) is in opposite direction compared to said fifth phase (Φ4), and

- a seventh phase (Φ6) wherein said first, second and third switches (S1, S2, S3) are in a non-conductive state and wherein no current flows through said coil (L).

4. A DC/DC up/down converter (30) according to claim 2 or 3, wherein said switching means (S1, S2, S3) comprise semiconductor switching means, in particular MOS (Metallic Oxide Semiconductor) transistor means.

5. A DC/DC up/down converter (30) according to claim 2, 3 or 4 further comprising capacitors (C1;C2) parallel connected to said first and second output terminals (33, 34) and said third and fourth output terminals (35, 36).

6. A power supply (45) comprising a DC/DC up/down converter (30) according to any of the previous claims, arranged for receiving a DC input voltage Vin at its input, and wherein said control means (40) are arranged for transferring an amount of electrical energy from said input to said energy storage means (L), such that during use said first output of said DC/DC converter (30) provides a voltage Vout1 and said second output of said DC/DC converter (30) provides a voltage Vout2, wherein Vout1 < Vin and Vout2 > Vout1.

7. A portable electronic appliance (50) comprising a DC/DC up/down converter (30) according to any of the previous claims.